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10/814,081	03/31/2004	Wu Chou	503038-A-01-US (Chou)	5517
7590 Ryan, Mason & Lewis, LLP 90 Forest Avenue Locust Valley, NY 11560				
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EXAMINER				
YEN, ERIC L.				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/814,081

**Applicant(s)**

CHOU ET AL.

**Examiner**

ERIC YEN

**Art Unit**

2626

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 July 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

1. In response to the Office Action mailed 4/8/08, applicant has submitted an amendment filed 7/8/08.

Claims 1, 10, 12, 15, and 18, have been amended.

### ***Response to Arguments***

2. Applicant's arguments filed 7/8/08 have been fully considered but they are not persuasive.

As per Claim 1, applicant argues that "Segond's disclosure that a list of rules may include both word-based rules and class-based rules fails to teach or suggest generating a plurality of terms by combining at least one word and at least one word class", and "instead, Segond teaches a technique wherein two distinct sets are respectively based on a dictionary and a semantic ontology" (Amendment, page 7).

It is not clear what applicant is trying to say, because the portion of Segond used to reject the claim is Figure 1. In Figure 1, a semantically ambiguous word (at least one word) in an input text is combined with disambiguation information (at least [one] word class), where disambiguation either classifies the ambiguous word as having its meaning in one context or another, as shown in Figure 1 where disambiguation is based on either a context X or a context Y. Figure 1 describes "a schematic flow diagram showing how a rule can be selected to disambiguate a word", (col. 5, lines 13-15).

Rule-based systems tend to use direct matching of an entity to one part of it to make a second determination and apply whatever actions correspond to the determination. Therefore, if the input is an ambiguous word, and there are multiple meanings depending on context, a rule would include the word and also the different contexts (and corresponding meanings), where the rule can be interpreted as a "term".

Applicant then argues that "claim 1 recites a further limitation wherein a joint classifier is configured to determine at least one category for the communication based on application of the plurality of terms to the plurality of words without considering whether a given one of the plurality of terms is a word or a word class", because "Segond teaches a technique which differentiates between word-based rules and class-based rules" (Amendment, page 7), and that Segond does not teach "classifying the communication containing the plurality of words" because "Segond instead teaches techniques for determining a meaning of a single word within a test".

The examiner respectfully disagrees, because, although the amended claim language recites "classifying the communication containing the plurality of words", the "classification" being done not only associates a particular context with a word, but also with the surrounding words used to determine what, exactly, the context is. This is because only analyzing the word itself is not enough to determine a context, and so by determining what context the word is in, it also classifies the remaining words surrounding it as being of the same context as well. Therefore, "the communication" is classified because, then, more than just the ambiguous word is determined to be of context X, for example, instead of one of the other contexts.

By determining the context for the words, it "determine(s) at least one category for the communication" because it determines the words belong to one context rather than another, and Second describes applying multiple rules in the cited portion (col. 11, lines 4-18). The limitations "without considering whether a given one of the plurality of terms is a word or a word class" is met because the rules themselves are neither a word nor a word class, and therefore the system would not require a step that determines whether it is one of those two things, because it already knows that it's not based on what a rule is.

As per Claim 10, applicant states that "the relied-upon portion of Second teaches a technique wherein one of a plurality of word-based rules may be selected by accessing type priority data to find the rules from the information type with the highest priority", and "this prioritization may be based on the relative reliability of results generated using the rules based on various types of dictionary information". Applicant then argues that "the relied-upon portion" "fails to disclose selection of words and word classes using information gain based term selection" and "the relied-upon portion of Second likewise fails to teach, or even mention, the term-category matrix recited in claim 10" (Amendment, page 8).

The examiner respectfully disagrees. As discussed above, the rules, in the previous Office Action, are what correspond to "terms". Second teaches, in the cited portion at col. 11, lines 33-49, "rules in an array". An array, generally, has a certain order or organization, which makes it a "matrix" in the sense that it is a structured

arrangement of information. Second also teaches that rules can be sorted based on what kind of rule they are, specifically "collocates, idioms, compounds," etc. Certainly, there is not only one rule for collocates since "collocates" is too broad in scope and difficult to synthesize a single rule for, and the same applies for the other categories (e.g., there is not only one idiom and idioms are large in number). Second also covers the "information gain based term selection" because, among other things, "information gain" does not define who are what is gaining information, nor does it define what information is being gained. If rules are selected based on what kind of rule is required (e.g., pertaining to an idiom, or a compound, etc.), then the selection of a rule is for the purpose of the system gaining the information needed to disambiguate a word. The "words" and "word classes selected using information gain based term selection" are "characterized" because a particular word, for example, is characterized as having a particular meaning when a context is determined, and "the word classes selected using information gain based term selection" are, for example, is the context identified, and is "characterized" as applying to the text, and this context information is "gained" for the purpose of disambiguation, in this example.

As per Claim 12, applicant states that "the relied-upon portion of Second teaches a technique wherein one of a plurality of word-based rules and one of a plurality of class-based rules may be selected by accessing type priority data to find the rules from the information type with the highest priority. This prioritization may be based on the relative reliability of results generated using rules based on various types of dictionary

information. The relied-upon portion of Segond also teaches a technique directed to selecting the class-based rule with a smallest distance between a list of classes of each of a plurality of class-based rules and the list of classes associated with a given word. This technique may also include returning only a class-based rule with a distance smaller than a threshold distance, which may (be) adjusted to find a critical distance value to optimize results". Applicant then argues that "the relied-upon portion of Segond, directed to selection of rules, fails to disclose selection of words and word classes using information gain based term selection", and "Segond's disclosure directed to calculating a distance between classes of a class-based rule and classes associated with a word fails to disclose the recited calculation of information gain values for each of a plurality of terms" (Amendment, page 9).

The examiner respectfully disagrees. First, the claim language does not claim "selection of words and word classes" as argued by applicant, in the sense that a word or a word class (and nothing else) is specifically what is selected. The claim language recites "wherein the information gain based term selection calculates information gain values for each of a plurality of terms, a given one of the terms comprising a word or a word class". As discussed above, a disambiguation rule, for example, provides the meaning of a word in a given context. Therefore, the rule must include, at least, the word and the context corresponding to the meaning, and therefore the rule/term "comprises" a word or a word class/context.

Applicant then argues that "claim 12 includes a limitation directed to selecting the terms having an information gain value greater than or equal to the information gain

value corresponding to a specified percentile", and "by contrast, the relied upon portion of Second teaches a technique directed to selecting a class-based rule having a distance between classes smaller than a threshold distance" (Amendment, page 9).

The "sort(ing of) the terms by their information gain values in a descending order is taught by the distance calculations that correspond to the rules. As discussed above, applicant does not define what an "information gain value" or what "information gain" constitutes. Second teaches a method of determining which rule to apply first, and if the object is to gain information pertaining to the rule, then the distance calculations and prioritization sorting values needed to organize the rules in an order are "information gain values" for "information gain". They are arranged in an order which is ascending or descending depending on perspective. Regardless, the rules are arranged in descending order because the lowest priority is at the "bottom" of the list of rules to be considered. The threshold set as the information gain value corresponding to a specified percentile, for example, the degree of priority of the second most prioritized rule or rule type. This corresponds to the percentile/percentage likelihood that the rule or rule set would be applicable because prioritization is generally done so that the most relevant or important item comes first, and therefore since the most important item exceeds the second most relevant item in relevance, then it exceeds the threshold for the "second most important" or "second most relevant" rule or rule set to become the "most important" or "most relevant" rule or rule set at the top of the priority list. The most important or most relevant rule or rule sets are selected to be applied first because



Second teaches that there is a prioritization scheme and not following the priority order would render prioritization worthless.

As per Claim 5, applicant argues that Second fails to teach the use of an information gain based term selection (Amendment, page 10).

The examiner respectfully disagrees, because, as discussed above, when a word is disambiguated using a corresponding rule, then the rule that contains the meaning also maps the meaning to the word and contains some reference to the context where the meaning applies, and so selecting a rule refers to the corresponding word and the context, which are the word and word class respectively.

As per Claim 6, applicant argues that "the relied-upon portion of Second fails to even mention either entropy variations or perplexity computations" (Amendment, page 10).

The examiner respectfully disagrees. Second teaches claim 6 because, as discussed above, information gain values are the values determining the prioritization. As discussed with respect to Claim 12, Second teaches prioritization based on, among other things, "information type", and processing one type could be more complicated than another because, for example, the collocates are more reliable and therefore have less "entropy" in the sense that they are more likely to produce reliable results, and since the other categories are not as reliable, their results have greater "entropy" in the sense that there is, for example, more errors in analysis. Since the rules processing the

different types are different, then they have different corresponding complexities, and a difference in complexity would result in different reliabilities (e.g., a simple classification or rule would not be reliable if it does not consider everything that needs to be considered, which has a greater risk of misclassification).

Alternatively, the distance measure can be interpreted as a perplexity computation because the larger the distance, the less likely it is to produce a coherent result in a particular situation.

As per Claim 7, applicant argues that Second does not teach "appending a class corpus to a word corpus" but rather teaches "a technique which uses two distinct sets of semantic tags respectively based on a dictionary and a semantic ontology" (Amendment, page 10).

The examiner respectfully disagrees, because if a corpus is used to derive disambiguation rules for different contexts, then, for example, there is a mapping of words used in a particular context within the corpus information described in Second, to one of the possible contexts used to generate the rules, and the set of all possible contexts or meanings or whatever other information is incorporated into the rule can be interpreted as a class corpus because it contains classification information to determine what sense a word is used in. They are "appended" because generating a rule attaches classification information to its corresponding word.

Therefore, the examiner maintains similar rejections to those previously presented.

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Segond et al. (6,405,162).

As per claim 1, Segond teaches, “a method of processing a communication in a communication system”, the method comprising the steps of:

“generating a plurality of terms by combining at least one word and at least word class” (Fig. 1);

“identifying a plurality of words contained within the communication” (Abstract);

“and classifying the communication containing the plurality of words by the plurality of words utilizing a joint classifier to determine at least one category communication based on application of the plurality of terms to the plurality of words without considering whether a given one of the plurality of terms is a word or a word class” (col. 11, lines 4-18; Figure 1; See Response to Arguments).

As per claim 2, Segond teaches, "wherein the joint classifier is implemented at least in part in a processor-based device of the communication system" (Section E. Miscellaneous).

As per claim 3, Segond teaches, "wherein a natural language call routing element of the switch routes the communication to a particular one of a plurality of destination terminals of the system based on the determined category" (section D. Application).

As per claim 4, Segond teaches, "wherein an automatic word class clustering algorithm is utilized to generate the word classes from at least one training corpus" (col. 2, line 57 to col. 3, line 10).

As per claim 5, Segond teaches, "wherein one or more of the words and word classes utilized to generate the plurality of terms are selected using information gain based term selection" (col. 3, lines 1-30).

As per claim 6, Segond teaches, "wherein the information gain based term selection determines an information gain value for each of the plurality of terms, the information gain value being indicative of entropy variations over a plurality of possible categories, and being determined as a function of a perplexity computation for an associated classification task" (col. 3, lines 1-30).

As per claim 7, Segoned teaches, "wherein the plurality of terms is generating by appending a class corpus to a word corpus" (col. 2, line 57 to col. 3, line 10).

As per claim 8, Segond teaches, "wherein plurality of terms is generated by joining sets of multiple words with corresponding sets of word classes" (col. 11, lines 4-18).

As per claim 9, Segond teaches, "wherein the plurality of terms is generated by interleaving individual words with their corresponding word classes" (col. 11, lines 4-18).

As per claim 10, Segond teaches, "A method of processing a communication in a communication system", the method comprising the steps of:

"identifying a plurality of words contained within the communication" (Abstract);  
and

"classifying the communication containing the plurality of words utilizing a joint classifier configured to determine at least one category for the plurality of words based on application of a combination of word information and word class information to the plurality of words" (col. 11, lines 4-18; Figure 1);

"wherein the combination of word information and word class information comprises at least one term-category matrix characterizing words and word classes selected using information gain based term selection" (col. 11, lines 33-49).

As per claim 11, Segoned teaches, "wherein a cell  $i, j$  of the term-category matrix comprises information indicative of a relationship involving an  $i$ -th selected term and  $aj$ -th category" (col. 11, lines 33-49).

As per claim 12, Segoned further teaches, "wherein the information gain based term selection calculates information gain values for each of a plurality of terms, a given one of the terms comprising a word or a word class, sorts the terms by their information

gain values in a descending order, sets a threshold as the information gain value corresponding to a specified percentile, and selects the terms having an information gain value greater than or equal to the threshold" (col. 11, line 38 to col. 12, line 17).

As per claim 13, Segoned teaches, "wherein the selected terms are processed to form a term-category matrix utilizable by the joint classifier in determining one or more categories for the plurality of words" (col. 11, lines 33-37).

As per claim 14, Segond teaches, "wherein the joint classifier comprises a joint latent semantic index classifier" (col. 11, lines 4-18).

As per claims 15-18, they are interpreted and thus rejected for the same reasons set forth in the rejection of claims 1-9 and 14.

### ***Conclusion***

3. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ERIC YEN whose telephone number is (571)272-4249. The examiner can normally be reached on M-F 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached on 571-272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

EY 10/9/08

/Patrick N. Edouard/  
Supervisory Patent Examiner, Art Unit 2626